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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/063,473

04/26/2002

Eddy Benjamin Boskamp

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11/06/2003

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EXAMINER

VARGAS, DIXOMARA

ART UNIT

PAPER NUMBER

2859

DATE MAILED: 11/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/063,473

Applicant(s)

BOSKAMP, EDDY BENJAMIN

Examiner

Dixomara Vargas

Art Unit

2859

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5, 7-11, 13-17, 19-23 and 25-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Mehdizadeh et al. (US 5,144,240).

With respect to claims 1, 7, 19 and 25, Mehdizadeh discloses an apparatus for magnetic resonance imaging, comprising (Figure 1): a degenerate birdcage coil (Figure 2, #24) having a pair of opposing rings and a plurality of rungs positioned circumferentially around said pair of rings (Figure 2); input excitation circuitry for applying excitation radio frequency (RF) energy to said degenerate birdcage coil at a first resonance mode thereof (Figure 1, #20); and output receiving circuitry for receiving RF energy emitted by an object positioned within said degenerate birdcage coil (Figure 1, #30), said output receiving circuitry receiving said emitted RF energy at a plurality of resonance modes of said degenerate birdcage coil, including said first resonance mode (Column 4, lines 3-18).

3. With respect to claims 2, 8, 14, 20 and 26, Mehdizadeh discloses said input excitation circuitry includes one or more phase shifting splitters for sinusoidally applying said excitation RF energy to one or more of said plurality of rungs (Columns 3 and 4, lines 53-68 and 1-2 respectively; Figure 1, #22a and #22b).

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4. With respect to claims 3, 9, 15, 21 and 28, Mehdizadeh discloses said output receiving circuitry includes one or more combiners for combining said emitted RF energy from one or more of said plurality of rungs (Column 4, lines 3-18; Figure 1, #22a and #22b).

5. With respect to claims 4, 10, 16, 22 and 29, Mehdizadeh discloses said one or more combiners include phase shifting combiners (Columns 3 and 4, lines 53-68 and 1-2 respectively; Figure 1, #22a and #22b).

6. With respect to claims 5, 11, 17, 23 and 30, Mehdizadeh discloses said degenerate birdcage coil is configured as a phased array by combining said emitted RF energy at each of said plurality of resonance modes (Columns 3 and 4, lines 53-68 and 1-18 respectively).

7. With respect to claim 13, Mehdizadeh discloses the claimed limitations as stated above in paragraph 4 and additionally discloses a computer (as seen on Figure 1) a magnet assembly for generating a polarizing magnetic field (Figure 1, #10); a gradient coil assembly for applying gradient waveforms to said polarizing magnetic field along selected gradient axes (Figure 1, #16) and a radio frequency (RF) transceiver system for applying RF energy to excite nuclear spins of an object to be imaged, and for thereafter detecting signals generated by excited nuclei of said object to be imaged (Figures 1 and 2; Abstract).

8. With respect to claim 27, Mehdizadeh discloses the step of configuring a 180° phase shifting splitter (Column 6, lines 6-9) and a pair of 90° phase shifting splitters for sinusoidally applying said excitation RF energy to one or more of said rungs of the degenerate birdcage resonator (Columns 3 and 4, lines 66-68 and 1-2 respectively).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 6, 12, 18, 24 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mehdizadeh et al. (US 5,144,240). in view of Harvey (US 6,522,140).

With respect to claims 6, 12, 18, 24 and 31, Mehdizadeh discloses the claimed invention as stated in paragraph 4 above except for each of said plurality of resonance modes is used for sensitivity encoding (SENSE). However, Harvey discloses the use of the SENSE method for each of said plurality of resonance modes (Abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use Harvey known SENSE method in Mehdizadeh's NMR resonator in the NMR system for the purpose of enabling the image acquisition to be performed with a reduced FOV (field of view); parallel, multi-channel detection in short as possible acquisition time.

Response to Arguments

11. Applicant's arguments filed August 28, 2003 have been fully considered but they are not persuasive.

12. Applicant argues that the prior art fails to teach the "receiving circuitry receiving said emitted RF energy at a plurality of resonance modes" which is detecting multiple resonance

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modes of a single frequency. In contrast the prior art discloses detecting two or more frequencies.

13. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., single frequency with multiple modes) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Applicant is reminded that the claims does not recite "single frequency modes" as stated in the arguments filed on page 4. In addition, the birdcage coil of the prior art receives at least a resonance mode for each frequency. Therefore, the MR system of the prior art receives multiple modes since at least one mode per each frequency is received from the different frequency signals of the birdcage coil.

Conclusion

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dixomara Vargas whose telephone number is (703) 305-5705.

The examiner can normally be reached on 8:00 am. to 4:30 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on (703) 308-3875. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0956.



Dixomara Vargas
Art Unit 2859
October 31, 2003



Diego Gutierrez
Supervisory Patent Examiner
Technology Center 2800